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Effect of human capital devolution process on the technical efficiency of public health facilities in Nakuru and Baringo Counties of Kenya

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Abstract

This study investigated how the process of human capital devolution affects the technical efficiency of public health facilities in Nakuru and Baringo Counties in Kenya. Despite the expectation that increased government expenditure would enhance efficiency, the public health sector in Kenya continues to need more efficiency. The study was guided by the Human Capital Theory. The human capital devolution process was measured by academic and professional qualification, training and conferences, research and publications, and expenditure on salaries and allowances. This study drew from the Cobb-Douglas production function theory. Employing a quantitative descriptive research design, the study targeted 3199 employees across 401 level 2-5 public health facilities, with a focused sample of 355 proportionately selected employees. Primary data was gathered using structured questionnaires coded and analysed using STATA/SPSS software. Technical efficiency was assessed using two-stage Data Envelopment Analysis (DEA) and multivariate logistic regression. The regression analysis results revealed a significant relationship between human capital and technical efficiency, with a coefficient of human capital development at 0.331 (T-value= 4.384, p-value= 0.000 < 0.05 significant level). This indicates a positive impact of human capital devolution on technical efficiency, where a unit increase in human capital development leads to a 0.331 increase in technical efficiency. The study recommends that financial challenges, the unequal distribution of national resources, and poor funding of devolution services can be solved by transferring all functions earmarked to County Governments as per Schedule IV in the Constitution of Kenya, 2010.

Key words: Cobb-Douglas production function, health devolution process, human capital, public health facilities, technical efficiency.



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INTRODUCTION

Devolution is among the common health sector reforms initiated in developing countries in the 1980s and 1990s. Since the early 1980s, many governments in Latin America and sub-Saharan Africa (SSA) have implemented formal reforms in the health sector. These reforms have been motivated by the dual objectives of enhancing efficiency and responding to demands for increased patient choice and participation (Willis & Khan, 2009). Proponents of the devolution process argue that it is enviable for improving health systems through improvements in allocative efficiency, cost efficiency, technical efficiency, economic growth, improved welfare, increased citizen participation, accountability, democracy and good governance (Nassar et al., 2020; Obasa, 2020; Gonçalves, 2014; Robinson, 2007; Magnussen et al., 2007; Bossert, 1998).

Empirical evidence from Latin America shows that in spite of increased health expenditure, many health systems are characterised by gross inequalities, reduced access to and utilisation of health care services, and deterioration in public health facilities simultaneous with perilous working conditions (Vázquez et al., 2009). In the Philippines, evidence shows that the devolution process does not always improve the health sector's efficiency, equity and effectiveness. On the contrary, such reforms can worsen existing inequities, undermine the local dedication to addressing critical health concerns, and diminish the efficiency and effectiveness of delivering services (Lakshminarayanan, 2003). In Colombia and Chile, devolution can improve resource allocation equity under certain circumstances (Bossert et al., 2003).

Despite the emergence of devolution as a primary objective on the agenda of national governments, there is limited empirical evidence on the potential benefits of devolution (Robalino et al., 2001). Several studies indicate that the empirical evidence of the effect of the devolution process on service delivery is weak, incomplete and often contradictory (Abimbola et al., 2019; Channa & Faguet, 2016). Evidence shows that despite increased health expenditures following decentralisation, local governments decreased the share of suitable public healthcare services (Schwartz et al., 2002). In the

United Kingdom, evidence shows that further devolution has little significance since responsibility for the National Health Services (NHS) is already devolved to each national administration (Katikireddi et al., 2017).

Empirical evidence shows that although increased government expenditure was expected to improve efficiency and better health outcomes in the pre-devolution era, Kenya's public health sector is inefficient (Makheti, 2017; Kinyanjui et al., 2015; Kipruto & Letting, 2017; San Sebastian & Lemma, 2010; Kirigia et al., 2004). However, there is need for more information on the technical efficiency of Kenya's public health facilities in the post-health devolution era. In order to fill the knowledge gap, this study examined the effects of the human capital devolution process on the technical efficiency of public health facilities in Nakuru.

LITERATURE REVIEW

In Africa, devolution is perceived to be neither good nor bad, with limited impact on service delivery (Abimbola et al., 2019; Cabral, 2011). In most countries of SSA, healthcare needs have increased due to evolving and re-emerging health challenges. Evidence from SSA indicates thin and mixed evidence of better service delivery attributed to devolution (Cabral, 2011). For example, the devolution of primary healthcare in Guinea, Mali, Benin, and Mozambique increased access to affordable health services (Mehrotra, 2006). However, the health devolution process has been inhibited by financial challenges, weak institutional capacity, inequitable taxes, elite capture and nepotism (Steiner, 2007). Unfortunately, for SSA, the availability of healthcare resources to mitigate these challenges has been continuously declining (Akin et al., 2005). In turn, this has jeopardised progress towards achieving the health-related Millennium Development Goals (Zere et al., 2006).

Kenya's New Constitution 2010 marked a shift from the central governance system to a devolved health system. Devolved health functions include hiring and firing staff, paying salaries, procuring medical commodities, managing public health facilities, and managing fiscal aspects. Evidence shows that devolution has improved governance, economic

efficiency and service delivery (Alexeev & Habodaszova, 2012; Mitchell & Bossert, 2010; Ghani et al., 2019; Ekpo, 2008; Cheema & Rondinelli, 2007). According to McCollum et al. (2018), Nshimirimana et al. (2016), and Chuma and Okungu (2011), Kenya's healthcare system faces financial and human resource constraints simultaneously with a dysfunctional health infrastructure.

Table 1 shows health expenditures by the national and county governments, the share of national government expenditures on health in total expenditures, County Government recurrent expenditures and development expenditures, registered health personnel, and the number of health facilities in Kenya between 2017 and 2023.

Table 1: Kenya Government's and County Governments' Expenditure on Health, Registered Health Personnel and Number of Health Facilities (2018-2022)

	2018/19	2020/21	2022/23 ^{*(1)}
National government expenditure on health (Kshs. Million)	92,023.6	108,838.6	109,796.5
Share of Government Expenditure on Health to Total Government Expenditure (%)	3.0	3.9	4.0
County Government Expenditure on Health (Kshs. Million)			
Recurrent Expenditure (Kshs. Million)	75,940.0	90,554.6	90,996.6
Development Expenditure (Kshs. Million)	16,083.6	18,284.0	18,796.9
Total Expenditure	92,023.6	108,838.6	109,796.5
Registered Health Personnel	154,539	191,004	224,291
Number of MoH Health Facilities ⁽²⁾	13,113	14,600	16,517

Note: ^{*(1)}-Provisional; ⁽²⁾ –Level 2 – (Dispensaries, Medical Clinics, Stand Alone); Level 3 (Health Centre); Level 4 – Primary Care Hospitals; Level 5- Secondary Care Hospitals; Level 6 – Tertiary Referral Hospitals; MoH-Ministry of Health

Source: RoK (2023) *Economic Survey, Nairobi: Government Printers (pg.361)*

From Table 1, it can be noted that the share of National Government expenditure on health increased from Kshs. 92 billion in 2018/19 to Kshs. 109.8 billion in 2022/23. While the ratio of national Government expenditure on health to total National Government expenditure was 3.0 per cent in 2018/19, this was expected to rise to 4.0 per cent in 2022/23. The share of County Governments'

expenditure on health to total County Governments' expenditure rose from 22.7 per cent in 2018/19 to 25.6 per cent in 2020/21, then reduced to 23.3 per cent in 2022/23. Similarly, health services expenditure by County Governments has steadily increased over the last five years. Further, the number of health facilities has increased from 13,113 in 2018 to 16,517 in 2022. Although government

expenditure on health has increased in absolute terms, it is less than 7 per cent of Gross Domestic Product (GDP). The ratio of doctors to population is currently 1: 16,000, which is higher than the recommended ratio by the World Health Organization.

Theoretical Framework

Human Capital Theory (HCT)

The Human Capital Theory (HCT) is traced to early works by Adam Smith (Spengler, 1977). Human capital is critical in the production process. It has been defined by Schultz (1961) and Nelson and Phelps (1966) as the capacity of workers to adapt to changing environments. On the other hand, Bowles et al. (1975) regarded it as the capacity to work, obey instructions and adapt to life. The HCT emphasises that education increases the productivity and efficiency of workers. The HCT is relevant to this

study, which, among others, examines the effect of the human capital devolution process on the technical efficiency of public health facilities in Kenya.

RESULTS AND DISCUSSION

Effect Of Academic and Professional Qualifications, Trainings and Conferences, Research and Publications on the Technical Efficiency of Public Health Facilities

Academic qualifications were measured by further training, professional qualifications, scholarships, licensing of health practitioners, training, attendance of local, regional, and international conferences, and research and publications. Table 2 summarises responses to the above aspects.

Table 2: Effect of Academic and Professional Qualifications, Trainings and Conferences, Research and Publications

	SD	D	NS	A	SA	CHSQ	P>CHI SQ
More members of staff have acquired academic qualifications through further training	15.67	25.00	14.33	40.00	5.00	105.13	<.0001
More members of staff have acquired professional qualifications	11.67	23.67	14.33	41.33	5.00	103.67	<.0001
Scholarships have increased	35.33	36.00	21.00	6.00	1.67	153.63	<.0001
Licensing for practitioners has been made easier	18.00	24.33	18.67	34.33	4.67	69.77	<.0001
There are more training opportunities available to staff	19.46	39.26	15.10	22.48	3.69	99.45	<.0001
More staff members attended local conferences	19.21	31.13	21.85	24.17	3.64	62.34	<.0001
More staff members attended regional conferences	21.89	40.4	22.56	13.47	1.68	119.48	<.0001
More staff members attended international conferences	42.09	29.97	22.22	4.04	1.68	175.58	<.0001
More staff members conduct research	21.89	40.40	22.56	13.47	1.68	133.96	<.0001
More staff members have research publications	29.43	33.78	26.76	8.03	2.01	118.34	<.0001

Key: SD = Strongly disagreed, D=Disagreed, NS=Neutral, A=Agreed and SA=Strongly Agreed

Source: Researchers, 2024

From the respondents interviewed, 45 per cent ($\chi^2 = 105.13 P \leq 0.01$) agreed that more staff members had acquired academic qualifications

through further training. In contrast, 46.33 per cent ($\chi^2 = 103.67, P \leq 0.01$) agreed that more staff members had acquired professional qualifications

due to human devolution in public health facilities. However, they disagreed 71.33 per cent ($\chi^2 = 153.63, P \leq 0.001$) that scholarships have increased, while 42.33 per cent ($\chi^2 = 69.77, P \leq 0.01$) disagreed that licensing for practitioners has been made more accessible. Further, the respondents disagreed with 58.72 per cent ($\chi^2 = 69.77, P \leq 0.01$) that more training opportunities are available to staff. While 50.34 per cent ($\chi^2 = 62.34 P \leq 0.01$) of respondents disagreed that more staff have attended local conferences, 50.34 per cent ($\chi^2 = 119.48 P \leq 0.01$) disagreed that more staff have attended regional conferences. About 72.06 per cent ($\chi^2 = 175.58 P \leq 0.01$) disagreed that more staff had attended international conferences. Further, the respondents disagreed 62.29 per cent

($\chi^2 = 133.96, P \leq 0.001$) that more staff members research, while 63.21 per cent ($\chi^2 = 118.34 P \leq 0.01$) disagreed that more staff members have research publications as a result of human capital devolution in public health facilities in both Baringo and Nakuru Counties of Kenya.

Effect of Expenditure on Salaries and Allowances on the Technical Efficiency of Public Health Facilities

This study examined employee recruitment, staff allowances, industrial tranquillity harmony and unrest, and salary expenditures to evaluate the effect of salary and Allowance expenditures on the technical efficiency of public health facilities. The results are presented in Table 3.

Table 3: Effect of Expenditure on Salaries and Allowances

Responses	SD	D	NS	A	SA	CHISQ	P>CHISQ
More employees were recruited	14.9	30.79	12.91	37.75	3.64	117.07	<.0001
Staff allowances have increased	36	40.00	13.67	8.67	1.67	174.1	<.0001
There was limited industrial unrest	23.67	27.33	24.67	21.67	2.67	58.83	<.0001
Expenditure on salaries has increased	15.33	20.33	19.00	37.33	8.00	70.1	<.0001

Key: SD = Strongly disagreed, D=Disagreed, NS=Neutral, A=Agreed and SA=Strongly Agreed

Source: Researchers, 2024

From Table 3, it is evident that respondents agreed 45.33 per cent that expenditure on salaries has increased. However, they disagreed 45.69 per cent that more employees had been recruited. Further, they disagreed 76 per cent that staff allowances had increased and disagreed 45.69 per cent that there was limited industrial unrest.

Regression Analysis Model Specification

In evaluating the effect of the human capital devolution process (HCD) on the technical efficiency of public health facilities in Kenya, the variables that were considered include academic and professional qualifications, training and conferences, research and publications, expenditures on salaries and

allowances, the effect of inherited health staff from defunct local authorities. These variables are presented as follows:

$$TE = f(ACPQ, TRCO, REPU, EXPSA)$$

Where:

Regression Analysis-Model Specification

TRCO, is Training and conferences; REPU, is research and publications; and EXPSA, is expenditure on salaries and allowances.

The following regression model represents these:

$$TE = \alpha_0 + \alpha_1 ACPQ + \alpha_2 TRCO + \alpha_3 REPU + \alpha_4 EXPSA + \mu_i$$

Where TE = Technical efficiency, α_0 = Intercept; $\alpha_1, \alpha_2, \alpha_3,$ and α_4 = independent variables, μ_i = Residual error.

Effect of Human Capital Devolution Process on the Technical Efficiency of Public Health Facilities

This section discusses the effect of the human capital devolution process on the technical efficiency of public

health facilities. From Table 4, the value of R-squared was 0.125. This implies that the independent variable (i.e. human capital development) accounts for 12.5 per cent of the variability in technical efficiency.

Table 4: Value of R-Square Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.354 ^a	.125	.119	7.55924	.125	19.221	1	134	.000

a. Predictors: (Constant), human_capital

Source: Researchers, 2024

From ANOVA in Table 5, it can be observed that (F(1,134)=19.221, p-value = 0.000) was less than 0.05 significant level. This means a significant relationship exists between human capital and

technical efficiency. This indicates that the human capital devolution process significantly affects the technical efficiency of the hospital in Kenya.

Table 5: ANOVA

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1098.353	1	1098.353	19.221	.000 ^b
	Residual	7657.052	134	57.142		
	Total	8755.404	135			

a. Dependent Variable: technical_efficiency
b. Predictors: (Constant), human_capital

Source: Researchers, 2024

Table 6 gives details of the coefficient of regression analysis. From the Table, the coefficient of human capital development is 0.331 with a (T-value=4.384, p-value= 0.000< 0.05 significant level). This means that human capital devolution has a positive effect on

technical efficiency. Thus, an increase of 1 unit of human capital development leads to an increase of 0.331 in technical efficiency.

Table 6: Coefficients of Regression Analysis

Coefficients ^a						
Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	25.922	2.760		9.392	.000

human_capital	.331	.076	.354	4.384	.000
a. Dependent Variable: technical_efficiency					

Source: Researchers, 2024

Discussion

From the findings of this study, most respondents agreed that more staff members have acquired academic qualifications through further training. They also agreed that more members of staff have acquired professional qualifications. The devolution of human resource responsibilities from human resource managers to line managers is both a growing and global trend. The development of human resources through intellectual capital not only significantly affects job satisfaction, but it has become the most important asset in measuring, evaluating and improving organisational performance (Mamy et al., 2020; Poh et al., 2018; Pawirosumarto et al., 2017; Khalique et al., 2014; Mention & Bontis, 2013; Khalique et al., 2011; Hsu & Fang, 2009; Cohen & Kaimenakis, 2007).

Globally, empirical evidence shows a positive relationship between training and employee commitment, innovation, and the effectiveness of people management (Jashari & Kutllovci, 2020; Manresa et al., 2019; Perry & Kulik, 2008). Studies on the effect of training on employees’ performance in Nigeria’s academic sector support the findings of this study. Research conducted by Paul and Audu (2019), Abiodun-Oyebanji (2019), and Ajayi and Okhankhuele (2019) demonstrates that factors such as promotion opportunities, incentives, job recognition, and job security have a notable impact on employees' productivity, leading to improved timeliness in service delivery and work quality in Nigeria. However, one major challenge was that management needed to release sufficient financial resources for adequate training.

Studies done both regionally and in Kenya indicate that training, innovation, employee commitment and enthusiasm impact organisational performance positively (Mirera, 2020; Manresa et al., 2019; Rufo, 2019; Maina, 2019; Mwandih, 2019; Mutsoli & Kiruthu, 2019; Makokha et al., 2017; Kepha, 2015; Mohamud, 2014; Oluoch, 2013). Studies on the effect of training on the performance of employees in County Governments of Kenya show that training

positively impacts employee performance and boosts productivity, morale, growth, job satisfaction, motivation, punctuality, and commitment (James et al., 2022; Kyui, 2022; Mwika, 2021; Wangui & Felistus, 2021; Mamy et al., 2020; Maitai & Ngari, 2019; Kirimi & Maende, 2019; Mahiri et al., 2019; Wacheke & Rosemarie, 2019; Lyimma, 2019; Jehow et al., 2018; Mwenda, 2018; Kioko, 2018; Muma et al., 2018; Odhong et al., 2018; Khaemba, 2017; Agoi, 2017; Mokaya, 2016; Cheboror, 2016; Mkinga, 2013). Empirical evidence shows that training positively boosts the performance of employees in Kenya’s public sector (Nyoike, 2020; Rukumba & Iravo, 2019; Tipis & Njoroge, 2019; Angweny, 2017; Ngari, 2015).

The World Health Organization (WHO) noted that investing in the health workforce generates qualified employment opportunities, stimulating economic growth (WHO, 2016). Evidence from Kenya’s health sector indicates that training practices, educational opportunities, talent development, promotions, remuneration practices, and work environment improve the performance of employees positively. That is, the performance of employees improves when recruitment and selection, rewards, benefits, and training are devolved (Mutsoli & Kiruthu, 2019; Kinyili, 2018; Ngure, 2018; Kilesi, 2018; Mukweyi, 2016; Oyugi, 2015).

In this study, respondents disagreed that scholarships have increased, licensing for practitioners has been made more accessible, more training opportunities are available to staff, and more staff attend local, regional and international conferences. Further, the respondents disagreed that more staff members conduct research and more staff members have research publications due to human capital devolution. Several factors account for this. Chief among them is the financial challenges that most County Governments in Kenya continue to face post-devolution. Other challenges include bureaucratic inefficiencies, lack of accountability and transparency, unequal distribution of national resources, limited community participation in local



development, and understaffing in public health facilities. Furthermore, lack of local capacity to mobilise resources, poor funding of devolution services, delays in disbursements of financial resources from the central government, corruption, lack of public participation, gender inequality, limited staff training and development policy challenges to health devolution (Kanyua, 2021; Masaba et al., 2020; Ngigi & Busolo, 2019; Tsofa et al., 2017; Wamuyu, 2016; Khaunya & Wawire, 2015). These challenges inhibit the ability of county governments to provide scholarships, training opportunities, research, and attendance at local, regional, and international conferences by staff in the devolved health sector in Kenya.

The respondents agreed that expenditure on salaries and allowances has increased due to human capital devolution in public health facilities in Baringo and Nakuru Counties of Kenya. However, they disagreed that more staff have been recruited, staff allowances have increased, and there is limited industrial unrest. Several empirical studies have been undertaken on the effect of human capital devolution on the public health sector. In Tanzania, peripheral health facilities are constrained by inadequate staffing, absenteeism, and low productivity (Manzi et al., 2012). In Uganda, there is the challenge of resource inadequacy and nepotism (Ssenkooba et al., 2007). In Kenya, the challenges facing human resources for health (HRH) seem to support the disagreement by respondents that more staff had been recruited, staff allowances have increased, and there is limited industrial unrest. For example, Garissa County faces the challenge of inappropriate recruitment methods, lack of training, and ineffective methods of procurement of medical facilities (Arale & Kiruthu, 2019).

In Muranga County of Kenya, the health sector faces financial challenges, such as unreliable, delayed, and insufficient funding and equipment (Njoroge & Moi, 2020). Evidence indicates that the HRH in the selected counties of Kenya is inadequately financed and faces a shortage of workers, which negatively impacts the quality of care and health outcomes

(Nyawira et al., 2022). The respondents disagree that more staff have been recruited, staff allowances have increased, and there is limited industrial unrest. Empirical evidence documents a chronology of industrial unrest in Kenya's health sector (Scanlon et al., 2021; Kaguthi et al., 2020; Njuguna, 2018; Irimu et al., 2018).

CONCLUSION AND RECOMMENDATION

Conclusion: The findings from this study underscore the complex dynamics surrounding health sector devolution in Kenya. While the aim of health devolution process was to enhance efficiency and citizen participation, challenges such as financial constraints, bureaucratic inefficiencies, and limited training opportunities persist. Although human capital devolution has led to improvements in staff qualifications and certain aspects of service delivery, critical areas like scholarships, practitioner licensing, and conference attendance remain areas of concern. The positive correlation identified between training and employee commitment, innovation, and effective people management suggests that investing in human capital development can yield significant benefits for organisational performance. The regression analysis further supports this notion by highlighting a significant relationship between human capital and technical efficiency. However, the study also reveals ongoing challenges in the healthcare system, including understaffing, funding delays, corruption, and limited community participation. Addressing these issues requires comprehensive strategies prioritising financial stability, transparent governance, equitable resource distribution, and robust staff development policies. Overall, the study emphasises the importance of continuous investment in human capital and systemic improvements to overcome the persistent challenges facing Kenya's healthcare sector.

Recommendation: Financial challenges, unequal distribution of national resources, and poor funding of devolution services from the central government can be solved by transferring all functions earmarked to County Governments as per Schedule IV in the Constitution of Kenya, 2010.

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